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TRANSMITTAL OF APPEAL BRIEF (Large Entity)

Docket No. 013550-069(2165)

In Re Application Of: **Bruce R. Smith et al.**

Application No.	Filing Date	Examiner	Customer No.	Group Art Unit	Confirmation No.
09/453,498	December 3, 1999	E. Kim	40256	3721	

Invention: **FOOD SERVING PAPERBOARD CONTAINER PRESSING APPARATUS EMPLOYING CAST-IN ELECTRICAL HEATERS**

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Transmitted herewith in triplicate is the Appeal Brief in this application, with respect to the Notice of Appeal filed on

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☐ A check in the amount of the fee is enclosed.

☐ The Director has already been authorized to charge fees in this application to a Deposit Account.

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Michael W. Ferrell
Signature

Dated: Nov. 29, 2004

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CERTIFICATE OF MAILING BY FIRST CLASS MAIL (37 CFR 1.8) Applicant(s): **Bruce R. Smith et al.**				Docket No. **013550-069(2165;GP-03-8)**
Application No. **09/453,498**	Filing Date **December 3, 1999**	Examiner **E. Kim**	Customer No.	Group Art Unit **3721**

Invention: **FOOD SERVING PAPERBOARD CONTAINER PRESSING APPARATUS EMPLOYING CAST-IN ELECTRICAL HEATERS**

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	:	
Bruce R. Smith et al.	:	Examiner: E. Kim
U.S. Serial No. 09/453,498	:	Group Art Unit: 3721
Filed December 3, 1999	:	
Docket No. 2165 (GP-03-8) (old 013550-069)	:	
For: FOOD SERVING PAPERBOARD CONTAINER PRESSING APPARATUS EMPLOYING CAST-IN ELECTRICAL HEATERS	:	

Mail Stop Appeal Brief - Patents
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P.O. Box 1450
Alexandria, Virginia 22313-1450

BRIEF ON APPEAL UNDER 37 CFR §41.37(c)

Sir:

Applicant hereby submits its *Brief on Appeal* in the above-noted United States Patent Application. A *Notice of Appeal* was submitted on August 31, 2004 appealing the rejection of Claims 1-21 and 23-26. Please charge the fee for the *Brief* to our Deposit Account No. 50-0935.

This *Brief* is being filed with a *Petition* and fee for a one-month *Extension of Time*. If additional extensions are required, please consider this paper a *Petition* therefor and charge our Deposit Account No. 50-0935.

I. REAL PARTY IN INTEREST

Georgia-Pacific Corporation, 133 Peachtree Street, N.E., Atlanta, Georgia 30303, is the real party in interest in this patent application. The *Assignment* to James River Corporation, its predecessor in interest, was recorded at Reel 010675 / Frame 0056 on March 3, 2000.

II. RELATED APPEALS AND INTERFERENCE

There are no related appeals, interferences or judicial proceedings related to, or which will affect, or which will be affected by, or which will have a bearing on the Board's decision in this appeal.

III. STATUS OF CLAIMS

Claims 1-26 are pending in this application. Claim 22 has been allowed; Claims 1-21 and 23-26 are on appeal. A complete listing of all claims on appeal appears in Appendix A hereto.

IV. STATUS OF AMENDMENTS

No amendments have been filed subsequent to the *Final Rejection* of August 31, 2004. A *Request for Reconsideration* filed on October 4, 2004 was denied in an *Advisory Action* of October 13, 2004.

V. SUMMARY OF CLAIMED SUBJECT MATTER

For purposes of this appeal, the pending claims are divided into three (3) groups as follows:

Group I includes Claims 1-21;

Group II includes Claims 23 and 25; and

Group III includes Claims 24 and 26.

Claim 1 is representative of Group I:

1. A pressing apparatus for producing from a paperboard blank a food service paperboard container having an overturned rim provided with folds, comprising:

a first die that includes a first base and a first platform movable with respect to the first base, said first base having a curved surface for engaging an outer periphery of a paperboard blank;

a second die positioned in opposing relation to the first die and including a second base and a second platform movable with respect to the second base, said second die being movable with respect to the first die, said second base having a curved surface for mating with the curved surface on the first die and engaging the outer periphery of the paperboard blank so that the outer periphery of the paperboard blank is pressed between the curved surface of the first base and the curved surface of the second base;

a first cast-in heater mounted within a recess in the first die, the first cast-in heater including a resistor wire embedded within a thermally conductive cast-in material; and

a second cast-in heater mounted within a recess in the second die, the second cast-in heater including a resistor wire embedded within a thermally conductive cast-in material.

Group II contains generally the features of Group I, but includes further recitation of surface-to-surface contact between a mounting surface of a forming die and a cast-in heater in proximity with a forming surface of the die. Claim 23 is representative of this group:

23. A pressing apparatus for producing a food service paperboard container from a paperboard blank, wherein the paperboard container has an overturned rim provided with folds, comprising:

a first die having a curved pressing surface and a recess with a recessed heater mounting surface in proximity with and opposed thereto;

a second die positioned in opposing relation to the first die and having a curved pressing surface and a recess with a recessed heater mounting surface in proximity with and opposed thereto, at least one of said first and second dies being movable relative to the other of the first and second dies

to cause an outer periphery of a paperboard blank to be pressed between the curved pressing surface of the first die and the curved pressing surface of the second die; and

a cast-in heater mounted in either the first die or the second die, the cast-in heater being configured and mounted such that a surface of the cast-in heater is in surface-to-surface contact with a recessed heater mounting surface in proximity with and opposed to a curved forming surface of the apparatus.

Group III is similar to Group I, except that an annular, or donut-like shape of the heater is specified. Claim 26 is representative of this group:

26. A pressing apparatus for producing a food service paperboard container from a paperboard blank, wherein the paperboard container has an overturned rim provided with folds, comprising:

a first die having a curved pressing surface;

a second die positioned in opposing relation to the first die and having a curved pressing surface, at least one of said first and second dies being movable relative to the other of the first and second dies to cause an outer periphery of a paperboard blank to be pressed between the curved pressing surface of the first die and the curved pressing surface of the second die; and

a cast-in heater mounted in either the first die or the second die, the cast-in heater having an annular shape.

The subject matter claimed in this application is seen in general in **Figures 13** and **14**, reproduced below, together with the text at page 24, beginning at line 19 through page 25, line 13.

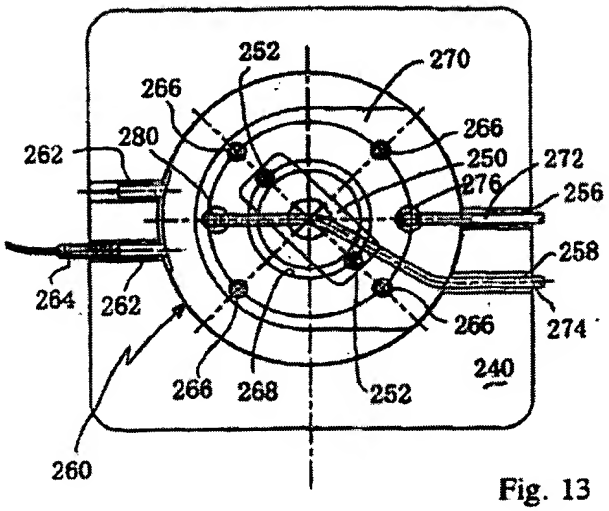


Fig. 13

Figures 13 and **14** illustrate a cast-in heater in accordance with the present invention mounted in a die of a die set. In the illustrated embodiment, the die is the upper punch die. The die **240** includes a forming surface **242** on one face of the die and a cavity **244** on the opposite face of the die. The die is also provided with a knockout punch **246** that is spring biased by way of a spring **248**. The spring **248** is biased between the knockout punch **246** and a plate **250** that is secured to the cast-in heater **260** by way of several screws **252**. The spring **248** biases the knockout punch **246** in a direction that causes the front surface of the knockout punch **246** to extend beyond the forming surface **242** of the die **240**. As an alternative to spring biasing the knockout punch **246**, it is also possible to eliminate the spring and allow the knockout punch **246** to operate by gravity. The movement of the knockout punch **246** is limited by a stopper **254** that is secured to a reduced diameter portion of the knockout punch **246** for engaging the bottom of the cavity **244**. As illustrated in **Figures 13** and **14**, the top surface of the die **240** is also provided with a pair of recesses **256, 258** that are adapted to receive air tubing, the purpose of which will be described in more detail below.

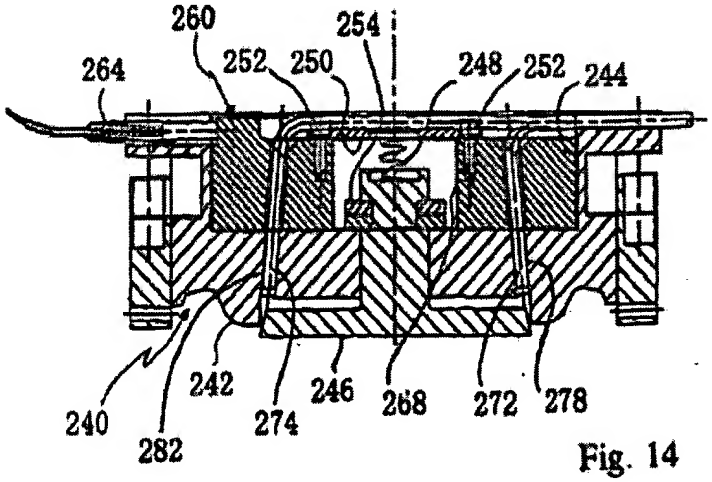


Fig. 14

It is appreciated in the art that the reciprocating pressware die sets run at relatively high frequency, 40 and more pressings a minute and that it is critical to maintain temperature within necessary limits (300 degrees + Fahrenheit) in order to press-form the paperboard under heat and pressure into plates, bowls and the like. The ability of the claimed apparatus to withstand a punishing production environment is critical to its commercial success. An appreciation of manufacturing parameters is gained by considering the *Van Handel et al. '500* reference, especially at Column 11:

> **In the typical forming operation, the web of paperboard stock is fed continuously from a roll through a cutting die (not shown) to form the circular blanks 27, which are then fed into position between the upper and lower dies 25 and 26. The dies are heated, as described above, to aid in the forming process. It has been found that best results are obtained if the upper die 25 and lower die 26—particularly the surfaces thereof—are maintained at a temperature in the range of 250° F. to 320° F. and most preferably 300° F. plus or minus 10° F. These die temperatures have been found to facilitate the plastic deformation of paperboard in the rim areas if the paperboard has the preferred moisture levels. At these preferred die temperatures, the amount of heat applied to the blank is apparently sufficient to liberate the moisture within the blank under the rim and thereby facilitate the deformation of the fibers without overheating the blank and causing blisters from liberation of steam or scorching the blank material. It is apparent that the amount of heat applied to the paperboard will vary with the amount of time that the dies dwell in a position pressing the paperboard together. The preferred die temperatures are based on the usual dwell times encountered for normal production speeds of 40 to 60 pressings a minute, and commensurately higher or lower temperatures in the dies would generally be required for higher or lower production speeds, respectively.**

Additional Evidence Submitted Bearing Upon Patentability

In this application, two (2) *Declarations* were submitted under 37 CFR §1.132, one (1) *Declaration of Mark B. Littlejohn* of April, 2004 which is in evidence Appendix B hereto and one (1) *Declaration Under 37 CFR §1.132 of Dana Markwell* of May, 2002 which is in evidence Appendix C hereto.

The May, 2002 *Declaration* was submitted as part of a *Request for Continued Examination Under 37 CFR §1.114* in July, 2001. The *Dana Markwell Declaration* appears to have been entered in the record by the Examiner on or about May 9, 2003, the date of the first Office Action on the first *RCE* filed in this application; however, the May, 2002 *Declaration* was not acknowledged in the Office Action of May, 2003.

The April, 2004 *Declaration of Mark B. Littlejohn* was filed as part of a second *Request for Continued Examiner Under 37 CFR §1.114* filed in April, 2004. The *Littlejohn Declaration* appears to have been entered on or about May 13, 2004, the date of the first Office Action after the second *RCE* was filed in this application wherein the Examiner acknowledged the *Littlejohn Declaration* on page 3 of the Office Action:

> In response to applicants' argument regarding the Declaration of Mr. Mark B. Littlejohn, the examiner notes that secondary reference Gospe et al is being used to teach the concept that cast-in heaters are interchangeable with various heating elements as discussed in col 4 lines 48+. Therefore, the combination is deemed proper and obvious to one of ordinary skill in the art. Furthermore, the examiner notes that mere selection of known materials, such as cast-in heaters, on the basis of suitability for the intended use would be entirely obvious. See in re Leshin, 125 USPQ 416 (CCPA 1960).
>
> May 13, 2004 Office Action, p. 3.

Although the Examiner did acknowledge receipt of the *Littlejohn Declaration*, the remarkable and unexpected durability of the claimed apparatus was not addressed at all. In this respect, Applicant notes paragraphs 6 and 9 of the April, 2004 *Declaration of Mark B. Littlejohn*:

> 6. That he understands from Counsel that a *Declaration of Dana Markwell* previously submitted in this application states on page 4 that 7 failures were experienced with 100 cast-in heaters in pressware die sets over a one-year period (a 7% failure rate per year) versus 345 failures over a one-year period with 60 conventional ring heaters (a 575% per annum failure rate) experienced with conventional heaters, which thus had an average useful life of about two (2) months.
>
> 9. That the commercial success of the Present Invention is due in large measure to the remarkable and unexpected reliability for the cast-in heaters noted above. A typical commercial press may have five or six die sets

each having at least two heaters in a single die set. A failure of one heater in one die set is enough to cause shutdown of the entire press.

The evidence of patentability in this application is believed compelling, especially the fact that the apparatus with cast in heaters has been found to be **EIGHTY (80)** times more reliable than other electrical heaters. The obviousness rejections are untenable in view of the *Soni* and *Stratoflex* cases, discussed below.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

In the *Final Rejection* of August 2, 2004, Claim 22 was allowed and Claims 1-21 and 23-26 were rejected on the basis of obviousness only over *Van Handel et al.*, United States Patent No. 4,721,500 in view of *Gospe et al.*, United States Patent No. 6,029,730. Following are concise statements of the obviousness issues on appeal with respect to Groups I, II and II, above:

1. Whether the record establishes the patentability of Claim Groups I, II and III because of unexpected, superior results in accordance with applicable precedent discussed herein.

2. Whether or not the references, *prima facie*, teach the combinations of Claim Group I.

3. Whether or not the references, *prima facie*, teach the combinations of Claim Group II.

4. Whether or not the references, *prima facie*, teach the combinations of Claim Group III.

5. Whether or not the record establishes, by a preponderance of the evidence, the patentability of Claim Groups I, II and III in any event.

VII. ARGUMENT

All of the obviousness rejections in this case apply an improper "obvious to try" standard which ignores the fact that there is no evidence of record whatsoever that cast in heaters are a preferred or even viable option for a reciprocating pressware die set where toughness is required. The secondary reference (*Gospe et al.*) applied by the Examiner for purposes of showing die-cast heaters is for stationary equipment; specifically an oven. There is no teaching in the references regarding their combination as urged by the Examiner. Accordingly, it is believed that the claimed combinations would be patentable even absent evidence of unexpected superior results and even absent evidence of commercial success. With that evidence, there is no doubt as to patentability in this case.

The obviousness rejections are untenable.

Even if there were a prima facie showing of obviousness, which is not believed the case here, the evidence of patentability is compelling. The claimed apparatus is over 80 times more reliable than a conventional, ring-heater equipped die set (575/7, see below). That is an increase in reliability of over eight thousand percent (8000%).

(A) The Declaration Evidence Establishes Unexpected and Superior Results

The evidence presented in Appendices B and C clearly meets the *Soni* standard. Consider paragraphs 6 through 9 of the *Littlejohn Declaration* which establish both superior results and that those results were unexpected:

> 6. That he understands from Counsel that a *Declaration of Dana Markwell* previously submitted in this application states on page 4 that 7 failures were experienced with 100 cast-in heaters in pressware die sets over a one-year period (a 7% failure rate per year) versus 345 failures over a one-year period with 60 conventional ring heaters (a 575% per annum failure rate) experienced with conventional heaters, which thus had an average useful life of about two (2) months.
>
> 7. That his personal experience with cast-in heaters is consistent with that reported by Dana Markwell. He is aware of instances where cast-in heaters have lasted over four (4) years of operation in a pressware die set, whereas conventional ring heaters are typically replaced in less than a year. That the longevity of the cast-in heaters in a pressware die set has provided incentive to

further invest in the technology since the *Markwell Declaration* was submitted in this application in 2002.

8. That despite their cost of over three hundred dollars ($300.00) apiece, Georgia-Pacific Corporation, Dixie Division, has already installed over seven hundred (700+) cast-in heaters and is planning on installing five hundred (500) more in 2004. In addition, all new paperboard pressware forming tools being commissioned by Georgia-Pacific include cast-in heaters in the die set.

9. That the commercial success of the Present Invention is due in large measure to the remarkable and unexpected reliability for the cast-in heaters noted above. A typical commercial press may have five or six die sets each having at least two heaters in a single die set. A failure of one heater in one die set is enough to cause shutdown of the entire press.

The law is believed quite clear when evidence such as the above is presented – this case should be allowed. *In re Soni,* 34 USPQ2d 1684, 1687 (CAFC 1995) is *apropos*:

> In our view, however, when an applicant demonstrates substantially improved results, as Soni did here, and states that the results were unexpected, this should suffice to establish unexpected results in the absence of evidence to the contrary. Soni, who owed the PTO a duty of candor, made such a showing here. The PTO has not provided any persuasive basis to question Soni's comparative data and assertion that the demonstrated results were unexpected. Thus, we are persuaded that the Board's finding that Soni did not establish unexpected results is clearly erroneous.

It is difficult to imagine a more compelling case of unexpected and superior results than presented here – almost 2 orders of magnitude improvement.

See, also, the *Declaration of Dana Markwell* which provides on page 4:

> Utilizing cast-in heaters in place of the previously used ring heaters has produced unexpected results. Indeed, with the use of cast-in heaters, we have been able to virtually eliminate heater failures. Between March 1, 2001 and February 28, 2002, the ten pressing machines described above have experienced only 7 cast-in heater failures requiring replacement of the cast-in heater. This represents a substantial decrease from the number of ring heater failures mentioned above -- 7 cast-in heater failures over a one-year period for ten pressing machines operating a total of 100 cast-in heaters versus 345 ring heater failures over a one-year period for four pressing machines operating a total of 60 ring heaters.

Declaration of Dana Markwell, May, 2002. The decrease in heater failures, 7/100 versus 345/60 is remarkable. In view of the *Declarations of Mark B. Littlejohn and Dana Markwell*, all claims are believed clearly allowable. *See* MPEP, Section 716(a) and following; *note* also, *In re Chupp*, 2 USPQ2d 1437 (CAFC 1987).

(B) The References Fail to teach the Combination of Claim Group I

The Examiner has stated that the rejected claims are obvious over United States Patent No. 4,721,500 of *Van Handel et al.* in view of United States Patent No. 6,029,730 to *Gospe et al. Van Handel et al.* '500 relates to the manufacture of paperboard containers, whereas *Gospe et al.* '730 does not. The selection urged by the Examiner is rebutted by the attached *Declaration of Mark B. Littlejohn*, in part because *Gospe et al.* '730 does not relate in any way to reciprocating pressware where durability is important and in part because of the high price of cast in heaters. *See Declaration of Mark B. Littlejohn*, paragraphs 5, 8. Is it obvious to select a much more expensive alternative in the real world?—clearly not.

The present invention is directed to a pressing apparatus with cast-in heaters, Claim 1 being illustrativeof Group I:

1. A pressing apparatus for producing from a paperboard blank a food service paperboard container having an overturned rim provided with folds, comprising:

    a first die that includes a first base and a first platform movable with respect to the first base, said first base having a curved surface for engaging an outer periphery of a paperboard blank;

    a second die positioned in opposing relation to the first die and including a second base and a second platform movable with respect to the second base, said second die being movable with respect to the first die, said second base having a curved surface for mating with the curved surface on the first die and engaging the outer periphery of the paperboard blank so that the outer periphery of the paperboard blank is pressed between the curved surface of the first base and the curved surface of the second base;

    a first cast-in heater mounted within a recess in the first die, the first cast-in heater including a resistor wire embedded within a thermally conductive cast-in material; and

> a second cast-in heater mounted within a recess in the second die, the second cast-in heater including a resistor wire embedded within a thermally conductive cast-in material.

Van Handel et al. '500 does not disclose cast-in heaters. The sum and substance of the'500 patent relied upon in the rejection appears at the bottom of Col. 7 and the top of Col. 8 of the '500 patent:

> In a conventional manner, the dies 25 and 26 are heated with electrical resistance heaters (not shown), and the temperature of the dies is controlled to a selected level by monitoring the temperature of the dies with thermistors (not shown) mounted in the dies as close as possible to the forming surfaces.

and Gospe et al. '730 teaches merely that cast-in heaters are one of many possible options for thermoelectric devices useful for heating an oven:

> It will be appreciated by persons of ordinary skill in the relevant arts that the foil heater **62** could be replaced with various heating elements such as an array of thermoelectric devices, a cable heater, a cartridge heater, a cast-in heater, or the like. Each replacement would provide functionally similar heating properties and capabilities as the foil heater **62**.

Gospe et al. '730, Col. 4, lines 48-53.

The combination of references relied upon in the *Final Rejection* is not taught by the references and is accordingly a hindsight selection. Why not select another type of heater? or another type of electric heater? such as for example, band heaters, cable heaters, cartridge heaters, ceramic fiber heaters, circulation heaters, flexible heaters, multicell heaters, multicoil heaters, polymer heaters, radiant heaters, strip heaters, thick film heaters and tubular heaters to name some of the options. Why not select a fluid heat transfer medium heater as is also taught by the '730 patent? The rejection of Claim Group I is based on an improper "obvious

to try" standard. *See In re Geiger* 2 USPQ2d 1276 (CAFC 1987) where the court ruled that the invention was not obvious in view of a proposed combination of references. The claimed invention required three components, whereas each of the components was conventionally employed in the references but all three are not employed in any one reference. In its reasoning, the court stated that: "Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching, suggestion or incentive supporting the combination."

See also MPEP §2143.01:

> **FACT THAT THE CLAIMED INVENTION IS WITHIN THE CAPABILITIES OF ONE OF ORDINARY SKILL IN THE ART IS NOT SUFFICIENT BY ITSELF TO ESTABLISH *PRIMA FACIE* OBVIOUSNESS**
>
> A statement that modifications of the prior art to meet the claimed invention would have been "well within the ordinary skill of the art at the time the claimed invention was made" because the references relied upon teach that all aspects of the claimed invention were individually known in the art is not sufficient to establish a prima facie case of obviousness without some objective reason to combine the teachings of the references. *Ex parte Levengood*, 28 USPQ2d 1300 (Bd. Pat. App. & Inter. 1993). See also *In re Kotzab*, 217 F.3d 1365, 1371, 55 USPQ2d 1313, 1318 (Fed. Cr. 2000) (Court reversed obviousness rejection involving technologically simple concept because there was no finding as to the principle or specific understanding within the knowledge of a skilled artisan that would have motivated the skilled artisan to make the claimed invention); Al-Site Corp. v. VSI Int'l Inc., 174 F.3d 1308, 50 USPQ2d 1161 (Fed. Cir. 1999) (The level of skill in the art cannot be relied upon to provide the suggestion to combine references.).

MPEP §2143.01, 4th heading.

It is also believed that inasmuch as the references do not even suggest the problem, much less a solution, the factual basis required by *In re Lee* to establish obviousness, *prima facie*, has not been met. In particular, the motivation to combine in the manner urged by the Examiner must appear in the references:

> In other words, the Board must explain the reasons one of ordinary skill in the art would have been motivated to select the references and to combine them to render the claimed invention obvious."); In re Fritch, 972 F.2d 1260, 1265, 23

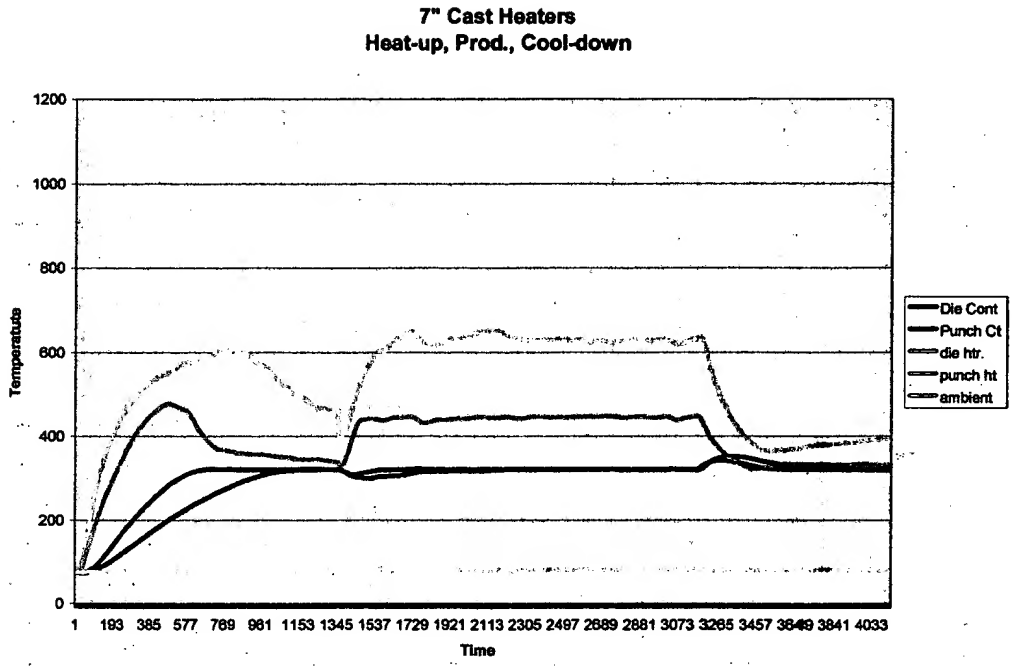
> USPQ2d 1780, 1783(Fed. Cir. 1992) (the examiner can satisfy the burden of showing obviousness of the combination "only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references").
>
> With respect to Lee's application, neither the examiner nor the Board adequately supported the selection and combination of the Nortrup and Thunderchopper references to render obvious that which Lee described. The examiner's conclusory statements that "the demonstration mode is just a programmable feature which can be used in many different device[s] for providing automatic introduction by adding the proper programming software" and that "another motivation would be that the automatic demonstration mode is user friendly and it functions as a tutorial"do not adequately address the issue of motivation to combine. This factual question of motivation is material to patentability, and could not be resolved on subjective belief and unknown authority. It is improper, in determining whether a person of ordinary skill would have been led to this combination of references, simply to "[use] that which the inventor taught against its teacher." W.L. Gore v. Garlock, Inc., 721 F.2d 1540, 1553, 220 USPQ 303, 312-13 (Fed. Cir. 1983). Thus the Board must not only assure that the requisite findings are made, based on evidence of record, but must also explain the reasoning by which the findings are deemed to support the agency's conclusion.
>
> Deferential judicial review under the Administrative Procedure Act does not relieve the agency of its obligation to develop an evidentiary basis for its findings. To the contrary, the Administrative Procedure Act reinforces this obligation. See, e.g., Motor Vehicle Manufacturers Ass'n v. State Farm Mutual Automobile Ins. Co., 463 U.S. 29, 43 (1983) ("the agency must examine the relevant data and articulate a satisfactory explanation for its action including a `rational connection between the facts found and the choice made.'") (quoting Burlington Truck Lines v. United States, 371 U.S. 156, 168 (1962)); Securities & Exchange Comm'n v. Chenery Corp., 318 U.S. 80, 94 (1943) ("The orderly function of the process of review requires that the grounds upon which the administrative agency acted are clearly disclosed and adequately sustained.").

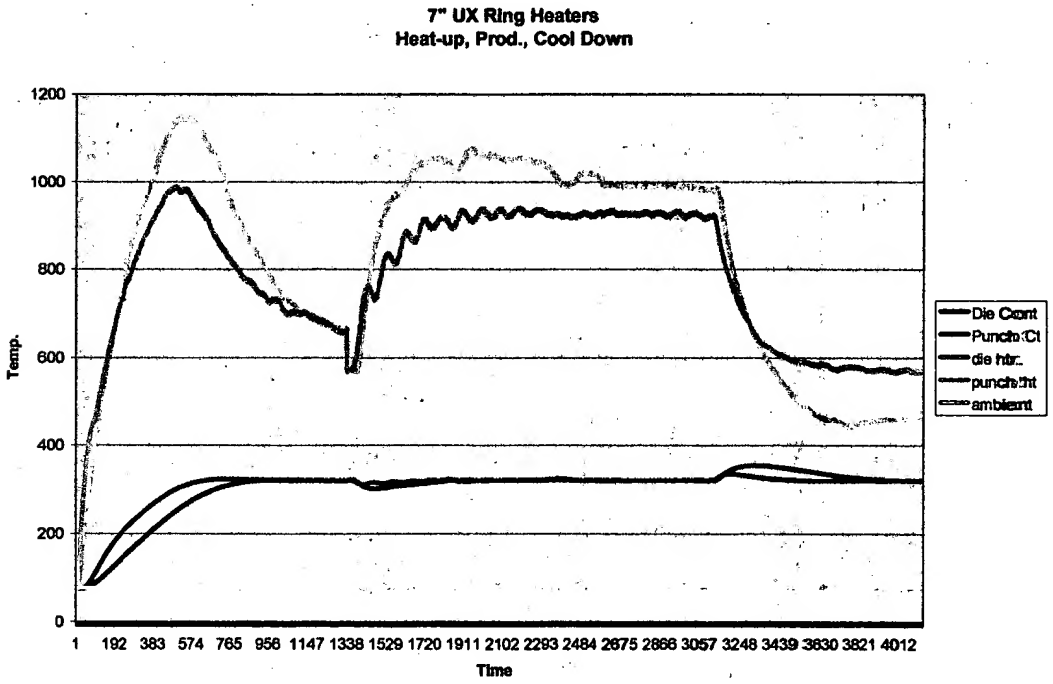
In re Lee, 61 USPQ2d 1430, 1434 (CAFC 2002).

(C) The References Fail to Teach the Combination of Claim Group II

Claim Group II is patentable for the reasons discussed above in connection with Claim Group I, and for the additional reason that the surface to surface contact between the mounting recess and the cast in heaters specified in the Claims enables much lower heater operating temperatures in order to maintain a die surface temperature. In this regard, note paragraphs 10-12 of the *Mark B. Littlejohn Declaration* as well Exhibits 2 and 3 of the *Declaration* where it seen that die cast heaters can operate some 500 degrees cooler in order to maintain the same forming temperature:

(invention)





(D) The References Fail to Teach the Combination of Claim Group III

Claim Group III is patentable for the reasons discussed above in connection with Claim Groups I and II and for the further reason that this Claim Group specifies an annular heater shape which further defines over the art cited and is believed to contribute to the lower operating temperatures and reliability.

(E) The Record in this Application Establishes Patentability by at least a Preponderance of Evidence

Even if there were a *prima facie* showing with respect to one or more of the claim groups, "the prima facie case is not a stone wall against which rebuttal evidence is tested; patentability is determined by a **preponderance** of **all** of the evidence." *In re Glaug*, 62 USPQ2d 1151, 1153 (CAFC 2002). The unexpected, superior results warrant allowance in this application; as does the commercial success of the claimed apparatus which is replacing **all** new forming tools in the Dixie® division of Georgia-Pacific Corporation. *Littlejohn Declaration*, ¶8. The commercial success evidence, like the evidence of unexpected and superior results, is compelling.

Stratoflex, Inc. v. Aeroquip Corporation (CAFC) 218 USPQ 871, 879, notes that evidence of secondary considerations is oftentimes the most important:

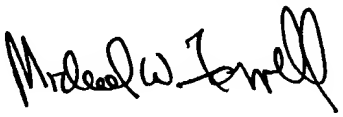
> It is jurisprudentially inappropriate to disregard any relevant evidence on any issue in any case, patent cases included. Thus evidence rising out of the so-called "secondary considerations" must always when present be considered en route to a determination of obviousness. In re Sernaker, 702 F.2d 989, 217 USPQ 1 (Fed. Cir. 1983) citing In re Fielder and Underwood, 471 F.2d 640, 176 USPQ 300 (CCPA 1973), see In re Mageli et al., 470 F.2d 1380, 1384, 176 USPQ 305, 307 (CCPA 1973) (evidence bearing on issue of nonobviousness "is never of 'no moment', is always to be considered and accorded whatever weight it may have.") Indeed, evidence of secondary considerations may often be the most probative and cogent evidence in the record. It may often establish that an invention appearing to have been obvious in light of the prior art was not. It is to be considered as part of all the evidence, not just when the decision maker remains in doubt after reviewing the art.

In the present application, compelling evidence of superior and unexpected results, as well as commercial success as evidenced by hundreds of thousands of dollars of investment in new equipment establishes patentability beyond question.

VIII. CONCLUSION

For the above reasons, all outstanding rejections should be canceled and all claims should be allowed.

Respectfully submitted,



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November 29, 2004

APPENDIX A
CLAIMS ON APPEAL

1. A pressing apparatus for producing from a paperboard blank a food service paperboard container having an overturned rim provided with folds, comprising:

a first die that includes a first base and a first platform movable with respect to the first base, said first base having a curved surface for engaging an outer periphery of a paperboard blank;

a second die positioned in opposing relation to the first die and including a second base and a second platform movable with respect to the second base, said second die being movable with respect to the first die, said second base having a curved surface for mating with the curved surface on the first die and engaging the outer periphery of the paperboard blank so that the outer periphery of the paperboard blank is pressed between the curved surface of the first base and the curved surface of the second base;

a first cast-in heater mounted within a recess in the first die, the first cast-in heater including a resistor wire embedded within a thermally conductive cast-in material; and

a second cast-in heater mounted within a recess in the second die, the second cast-in heater including a resistor wire embedded within a thermally conductive cast-in material.

2. The pressing apparatus according to Claim 1, wherein the recess in which the first cast-in heater is mounted is in the first base.

3. The pressing apparatus according to Claim 2, wherein the recess in which the second cast-in heater is mounted is in the second base.

4. The pressing apparatus according to Claim 1, wherein the cast-in material of the first and second cast-in heaters is a thermally conductive material.

5. The pressing apparatus according to Claim 4, wherein the cast-in material for the first and second cast-in heaters is a ferrous or non-ferrous based alloy including an iron-based alloy, an aluminum-based alloy, a copper-based alloy, a magnesium-based alloy, a nickel-based alloy or a titanium-based alloy.

6. The pressing apparatus according to Claim 1, wherein the resistor wire of the first and second cast-in heaters is a coiled resistor wire located within a sleeve.

7. The pressing apparatus according to Claim 1, wherein only a single cast-in heater is mounted in the first die and only a single cast-in heater is mounted in the second die.

8. A pressing apparatus for producing a food service paperboard container from a paperboard blank, wherein the paperboard container has an overturned rim provided with folds, comprising:

a first die having a curved pressing surface;

a second die positioned in opposing relation to the first die and having a curved pressing surface, at least one of said first and second dies being movable relative to the other of the first and second dies to cause an outer periphery of a paperboard blank to be pressed between the curved pressing surface of the first die and the curved pressing surface of the second die; and

a cast-in heater mounted in either the first die or the second die.

9. The pressing apparatus according to Claim 8, wherein the cast-in heater is mounted in a recess in the first die.

10. The pressing apparatus according to Claim 9, wherein the cast-in heater is mounted in the first die and constitutes a first cast-in heater, and including a second cast-in heater mounted in the second die.

11. The pressing apparatus according to Claim 8, wherein the cast-in heater includes a resistor wire embedded within a thermally conductive cast-in material.

12. The pressing apparatus according to Claim 11, wherein the cast-in material is a ferrous or non-ferrous based alloy including an iron-based alloy, an aluminum-based alloy, a copper-based alloy, a magnesium-based alloy, a nickel-based alloy or a titanium-based alloy.

13. The pressing apparatus according to Claim 11, wherein the resistor wire is a coiled resistor wire located within a sleeve.

14. The pressing apparatus according to Claim 8, wherein a single cast-in heater is mounted in the first die and a single cast-in heater is mounted in the second die.

15. The pressing apparatus according to Claim 8, wherein the first die includes a first base and a first platform movable with respect to the first base, said curved surface being provided on said first base.

16. The pressing apparatus according to Claim 8, wherein the second die includes a second base and a second platform movable with respect to the second base, said curved surface being provided on said second base.

17. The pressing apparatus according to Claim 1, wherein the first cast-in heater is removably mounted in the recess in the first die, and the second cast-in heater is removably mounted in the recess in the second die.

18. The pressing apparatus according to Claim 8, wherein the cast-in heater is removably mounted in either the first die or the second die.

19. A pressing apparatus for producing from a paperboard blank a food service paperboard container having an overturned rim provided with folds, comprising:

a first die having a curved pressing surface;

a second die positioned in opposing relation to the first die and having a curved pressing surface, at least one of said first and second dies being movable relative to the other of the first and second dies to cause an outer periphery of a paperboard blank to be pressed between the curved pressing surface of the first die and the curved pressing surface of the second die; and

a heating element embedded within a thermally conductive cast-in material to form a cast-in heater, the cast-in heater being removably positioned in either the first die or the second die.

20. The pressing apparatus according to Claim 19, wherein the cast-in heater is mounted in a recess in either the first die or the second die.

21. The pressing apparatus according to Claim 19, wherein the cast-in heater is a first cast-in heater that is mounted in the first die and including a second cast-in heater mounted in the second die.

23. A pressing apparatus for producing a food service paperboard container from a paperboard blank, wherein the paperboard container has an overturned rim provided with folds, comprising:

a first die having a curved pressing surface and a recess with a recessed heater mounting surface in proximity with and opposed thereto;

a second die positioned in opposing relation to the first die and having a curved pressing surface and a recess with a recessed heater mounting surface in proximity with and opposed thereto, at least one of said first and second dies being movable relative to

the other of the first and second dies to cause an outer periphery of a paperboard blank to be pressed between the curved pressing surface of the first die and the curved pressing surface of the second die; and

a cast-in heater mounted in either the first die or the second die, the cast-in heater being configured and mounted such that a surface of the cast-in heater is in surface-to-surface contact with a recessed heater mounting surface in proximity with and opposed to a curved forming surface of the apparatus.

24. The pressing apparatus according to Claim 23, wherein the cast-in heater has an annular shape.

25. The pressing apparatus according to Claim 23, wherein at least one of the recesses of the dies has a peripheral wall extending away from the heater mounting surface of the recess and has a cast-in heater mounted in the recess in surface to surface contact with the peripheral wall of the recess.

26. A pressing apparatus for producing a food service paperboard container from a paperboard blank, wherein the paperboard container has an overturned rim provided with folds, comprising:

a first die having a curved pressing surface;

a second die positioned in opposing relation to the first die and having a curved pressing surface, at least one of said first and second dies being movable relative to the other of the first and second dies to cause an outer periphery of a paperboard blank to be pressed between the curved pressing surface of the first die and the curved pressing surface of the second die; and

a cast-in heater mounted in either the first die or the second die, the cast-in heater having an annular shape.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	:	
Bruce R. Smith et al.	:	Examiner: E. Kim
U.S. Serial No. 09/453,498	:	Group Art Unit: 3721
Filed December 3, 1999	:	
Docket No. 2165 (GP-03-8) (old 013550-069)	:	
For: FOOD SERVING PAPERBOARD CONTAINER PRESSING APPARATUS EMPLOYING CAST-IN ELECTRICAL HEATERS	:	

Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

DECLARATION OF MARK B. LITTLEJOHN
UNDER 37 CFR §1.132

Sir:

Mark B. Littlejohn, a co-inventor of the subject matter of the above-noted patent application (sometimes referred to below as the Present Invention), makes the following statements in support of patentability.

1. That he was awarded a Bachelor of Science Degree in Mechanical Engineering from the University of Wisconsin, Madison, and has worked at the Dixie® products division, now of Georgia-Pacific Corporation, for many years in connection with the operation, design and improvement of pressware die sets for making paperboard containers such as plates, bowls and the like. A listing of issued patents of which he is an inventor of the subject matter is attached as Exhibit 1.

2. That he understands from Counsel that most claims in the above-noted patent application have been rejected as obvious over United States Patent No. 4,721,500 to *Van Handel et al.* in view of United States Patent No. 6,029,730 to *Gospe et al.* He is familiar with the '500 *Van Handel et al.* patent and has reviewed the '730 patent of *Gospe et al.*

3. That *Van Handel et al.* '500 discloses electrical resistance heaters for pressware die sets (col. 7 - col. 8, bridging text) and *Gospe et al.* '730, which relates to an oven for separating components of packaged semi-conductor chips contains the following text at col. 4, lines 48-53:

> It will be appreciated by persons of ordinary skill in the relevant arts that the foil heater **62** could be replaced with various heating elements such as an array of thermoelectric devices, a cable heater, a cartridge heater, a cast-in heater, or the like. Each replacement would provide functionally similar heating properties and capabilities as the foil heater **62**.

4. That, in his opinion, the *Van Handel et al.* '500 and *Gospe et al.* '730 patents do not suggest the Present Invention which resides, in part, in the remarkable durability of cast-in heaters in pressware die sets. In this connection, it is noted that pressware die sets are typically operated at 40-60 pressings per minute for 9" or 10" paper plates (*Van Handel et al.* '500, col. 11, lines 33-38) while *Gospe et al.* '730 relates to an essentially stationary oven. Operating issues such as durability, distortion, or warping of components, heat transfer and so forth are accordingly minimal as regards the '730 *Gospe et al.* Patent, but are extremely important with respect to pressware die sets.

5. One of skill in the art would not make the selection proposed by the Examiner without knowledge of the Present Invention because cast-in heaters are much more expensive than conventional heaters, costing up to ten (10) times as much. *See* application as filed, p. 37 which is consistent with his knowledge of relative costs of conventionally-used heaters versus cast-in heaters in a pressware die set.

6. That he understands from Counsel that a *Declaration of Dana Markwell* previously submitted in this application states on page 4 that 7 failures were experienced with 100 cast-in heaters in pressware die sets over a one-year period (a 7% failure rate per year) versus 345 failures over a one-year period with 60 conventional ring heaters (a 575% per annum failure rate) experienced with conventional heaters, which thus had an average useful life of about two (2) months.

7. That his personal experience with cast-in heaters is consistent with that reported by Dana Markwell. He is aware of instances where cast-in heaters have lasted over four (4) years of operation in a pressware die set, whereas conventional ring heaters are typically replaced in less than a year. That the longevity of the cast-in heaters in a pressware die set has provided incentive to further invest in the technology since the *Markwell Declaration* was submitted in this application in 2002.

8. That despite their cost of over three hundred dollars ($300.00) apiece, Georgia-Pacific Corporation, Dixie Division, has already installed over seven hundred (700+) cast-in heaters and is planning on installing five hundred (500) more in 2004. In addition, all new paperboard pressware forming tools being commissioned by Georgia-Pacific include cast-in heaters in the die set.

9. That the commercial success of the Present Invention is due in large measure to the remarkable and unexpected reliability for the cast-in heaters noted above. A typical commercial press may have five or six die sets each having at least two heaters in a single die set. A failure of one heater in one die set is enough to cause shutdown of the entire press.

10. That the durability of cast-in heaters in a pressware die set is believed due, in part, to their ability to heat forming surfaces to a desired temperature for forming with a lower heater temperature because of better heat transfer. In this regard, there is attached as Exhibits 2 and 3 plots of various temperatures in substantially identical die sets for making 7" paperboard plates using conventional ring heaters versus

cast-in die heaters, respectively, under typical production conditions (40-60 pressings per minute and more). In both cases, the temperature of the forming surfaces is maintained at about 320°F during production.

11. It is seen in the simulated temperature data of Exhibit 2 that conventional ring heaters must be operated between about 900°F to about 1100°F or so in order to maintain the desired forming surface temperature of 320°F with conventional ring heaters under production conditions.

12. It is seen in Exhibit 3 that the cast-in heaters can maintain the desired surface temperatures under the same production conditions as Exhibit 2 with heater temperatures between about 425°F and 625°F. The heater temperature difference in the two cases is quite remarkable given the same production rates and forming surface temperatures.

13. The undersigned Declarant declares further that all statements made herein of his own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the subject application or any patent issuing thereon.

Signed this 7th day of April, 2004.

Mark B. Littlejohn

Exhibit 1
United States Patents; Mark B. Littlejohn

United States Patent No.	Title
6,700,106	Disposable, microwaveable containers having suitable food contact compatible olfactory properties and process for their manufacture
6,670,592	Thermoformed polypropylene mineral-filled microwaveable containers having food contact compatible olfactory properties and process for their manufacture
6,666,673	Side mounted temperature probes for pressware die sets
6,592,357	Rotating inertial pin blank stops for pressware die sets
6,589,043	Punch stripper ring knock-out for pressware die sets
6,585,506	Side mounted temperature probes for pressware die sets
6,571,980	Smooth profiled food service articles
6,474,497	Smooth profiled food service articles
6,459,075	Thermoformed polypropylene mineral-filled microwaveable containers having food contact compatible olfactory properties and process for their manufacture
6,440,509	Compartmented disposable plate with asymmetric rib geometry
6,420,689	Disposable, microwaveable containers having suitable food contact compatible olfactory properties and process for their manufacture
6,403,936	Disposable, microwaveable containers having suitable food contact compatible olfactory properties and process for their manufacture
6,401,962	Disposable food serving bowl
6,371,327	Compartmented disposable food service articles with angular junctions thermoformed with plug-assist

Exhibit 1
United States Patents; Mark B. Littlejohn

United States Patent No.	Title
6,255,636	Disposable, microwaveable containers having suitable food contact compatible olfactory properties and process for their manufacture
6,241,096	Disposable servingware with nesting resistant flange patterns
6,211,501	Thermoformed polypropylene mineral-filled microwaveable containers having food contact compatible olfactory properties and process for their manufacture
6,211,500	Disposable, microwaveable containers having suitable food contact compatible olfactory properties and process for their manufacture
6,120,863	Disposable food contact compatible microwaveable containers having at least one micronodular surface and process for their manufacture
6,100,512	Microwaveable micronodular surface including polypropylene, mica and talc
5,887,781	Hexagonal paperboard carton with thermoformed reinforcing lid
5,377,860	Double seal food container
5,326,020	Rigid paperboard container
5,088,640	Rigid four radii rim paper plate
D450,580	Sealable food serving container
D450,221	Food serving plate
D445,304	Food serving plate
D445,303	Food serving plate
D437,527	Flange pattern for a disposable food serving plate

Exhibit 1
United States Patents; Mark B. Littlejohn

United States Patent No.	Title
D434,605	Three compartment disposable food serving plate with asymmetric rib geometry
D434,604	Flange pattern for a disposable food serving bowl
D346,934	Compartmented oval container

EXHIBIT 2
Temperature (°F) vs. Time (Seconds)
CONVENTIONAL HEATERS

7" UX Ring Heaters
Heat-up, Prod., Cool Down

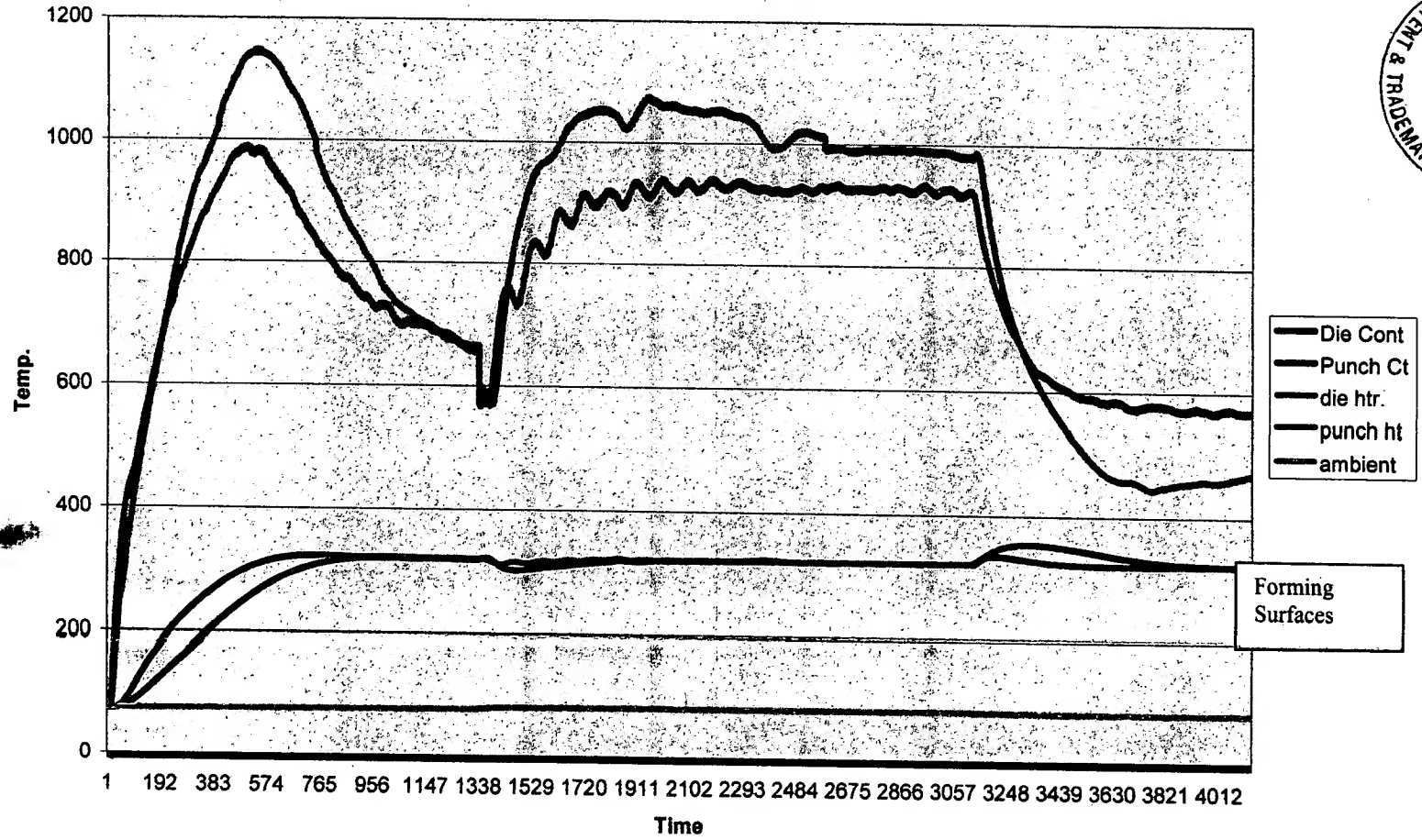
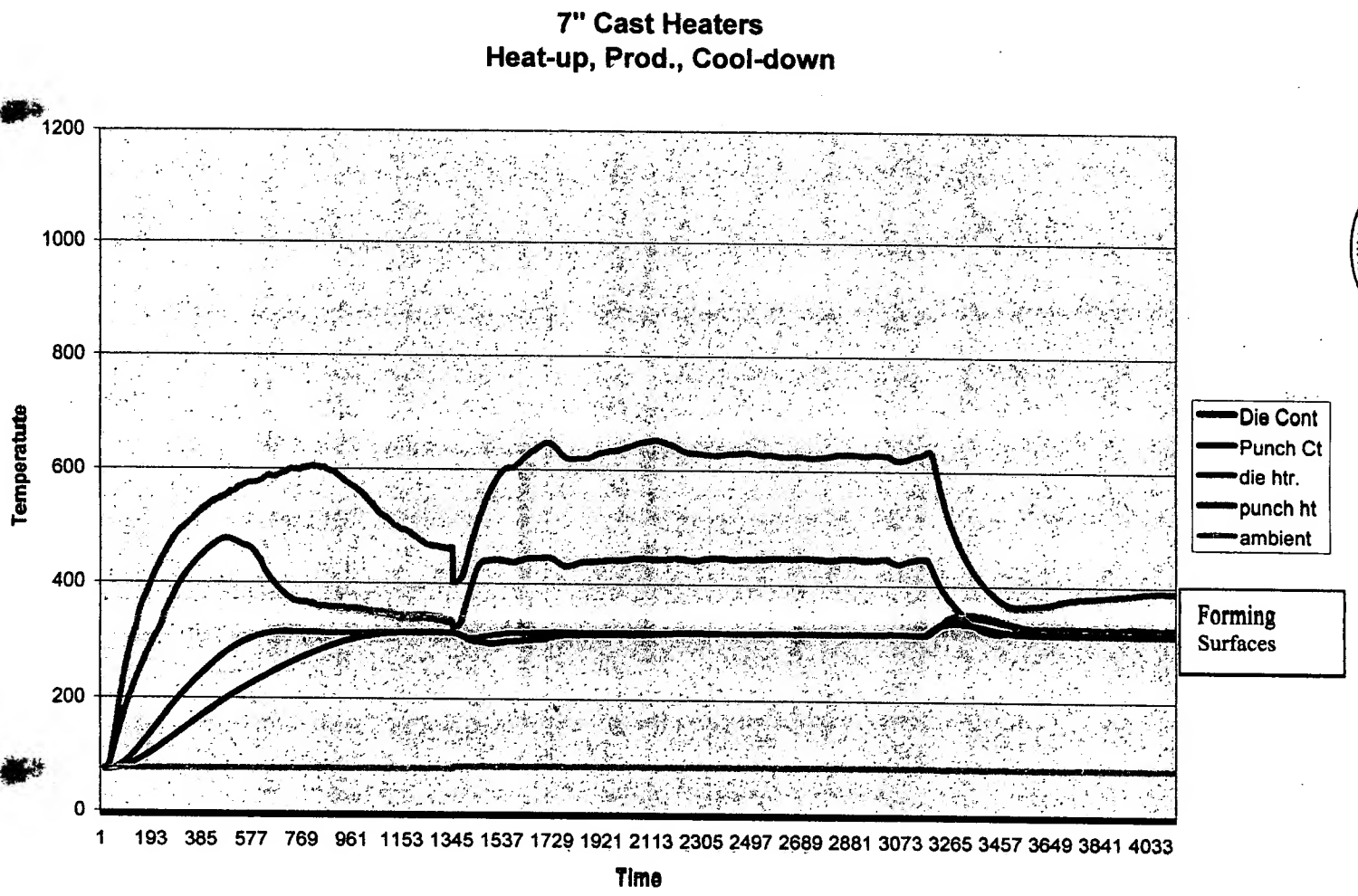


EXHIBIT 3
Temperature (°F) vs. Time (Seconds)
INVENTION APPARATUS



Patent
Attorney's Docket No. 013550-069

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of	)	
	)	
Bruce R. SMITH et al.	)	Group Art Unit: 3721
	)	
Application No.: 09/453,498	)	Examiner: Eugene L. Kim
	)	
Filed: December 3, 1999	)	
	)	
For: FOOD SERVING PAPERBOARD CONTAINER PRESSING APPARATUS EMPLOYING CAST-IN ELECTRICAL HEATERS	)	

DECLARATION UNDER 37 C.F.R. § 1.132

Assistant Commissioner for Patents
Washington, D. C. 20231

Sir:

I, Dana Markwell, do hereby declare as follows.

I am employed by Georgia-Pacific Corporation which recently acquired Fort James Corporation, the named assignee in this application. I have been employed by Georgia-Pacific Corporation/Fort James Corporation since the latter part of 1992.

I am currently the project engineer at the Georgia-Pacific Corporation manufacturing facility in Bowling Green, Kentucky, and have held this position since about the middle part of 1997. My responsibilities primarily involve overseeing technical and process improvements, and new installations in the facility.

Products manufactured at the Bowling Green plant include pressed food service paperboard articles such as paper plates, paper trays and the like. These products are manufactured through use of pressing machines having heated upper and lower dies (punch

and die) which together form a die set. Each pressing machine includes five die sets so that each stroke of the pressing machine results in the production of five pressed food service paperboard articles.

Up until the last several years, we used electrically resistive ring heaters to heat the die sets in these pressing machines. Each die set was heated by three ring heaters; two ring heaters in one of the dies and one ring heater in the other die. With these ring heaters, we experienced an incredibly high incidence of ring heater failure during normal operation of the pressing machines.

In 1997 for example, we operated four pressing machines in our Bowling Green facility to produce nine-inch paper plates. Each of the five die sets in each of the four pressing machines was heated by three ring heaters. Thus, a total of 60 ring heaters were used in the five pressing machines. Between January 1, 1997 and December 31, 1997, these four pressing machines experienced a total of 345 ring heater failures requiring replacement of the ring heater. Each time one of the ring heaters would fail, the entire pressing machine would be stopped and the failed ring heater replaced. Thus, each ring heater failure resulted in lost production time not only with respect to the die set having the failed ring heater, but also with respect to the other four die sets of the pressing machine. Consequently, in addition to the cost of the new ring heater, the replacement of failed ring heaters resulted in significant lost production.

It is believed that the significantly high failure rate of these ring heaters is attributable to several factors. The manufacture of pressed food service paperboard articles

usually requires relatively high temperatures which typically means that the ring heaters must possess a very high wattage. In operation, the ring heaters are oftentimes run at a wattage on the order of 1500 watts - 5000 watts. This significantly exceeds the power wattage ratings of the ring heaters which is typically on the order of 300 watts - 1200 watts. We have found that operating the ring heaters at levels greatly exceeding their power wattage ratings significantly reduces the life of the ring heaters.

In addition, ring heaters are susceptible to the ingress of water. During operation of the ring heater, this water is transformed into steam pressure which can distort the sheath of the ring heater so that the sheath takes on a somewhat curved configuration. This results in a rather substantial loss of contact area with the die, thus reducing heat transfer to the die and placing further strain on the operational rating of the ring heater. That is, when the ring heater distorts, heat is not effectively transferred to the die and so the thermocouple which measures the temperature near the surface of the die determines that the die heating surface is not sufficiently hot. This causes the ring heaters to be run at full wattage and higher temperatures for longer periods of time, and creates further operational problems that significantly reduce the operating life of the ring heaters.

We recently replaced the ring heaters used in the four pressing machines mentioned above with cast-in heaters. With the use of cast-in heaters, only two cast-in heaters are required for each die set; one cast-in heater in one of the dies and one cast-in heater in the other die. Other than replacing the ring heaters with cast-in heaters, these four pressing machines have not been changed. We have also added six additional pressing machines in

the Bowling Green facility for producing nine-inch paper plates. Each of these six additional pressing machines also has five die sets, with each of the die sets being heated by two cast-in heaters. We thus have ten pressing machines currently operating at the Bowling Green facility for manufacturing nine-inch plates, with a total of 100 cast-in heaters being used in the ten machines.

Utilizing cast-in heaters in place of the previously used ring heaters has produced unexpected results. Indeed, with the use of cast-in heaters, we have been able to virtually eliminate heater failures. Between March 1, 2001 and February 28, 2002, the ten pressing machines described above have experienced only 7 cast-in heater failures requiring replacement of the cast-in heater. This represents a substantial decrease from the number of ring heater failures mentioned above -- 7 cast-in heater failures over a one-year period for ten pressing machines operating a total of 100 cast-in heaters versus 345 ring heater failures over a one-year period for four pressing machines operating a total of 60 ring heaters.

This significant reduction in the incidence of heater failures associated with the use of cast-in heaters has also resulted in a substantial decrease in the amount of machine down-time. We have thus seen a rather large increase in productivity and output of the pressing machines as compared to when we were using ring heaters.

It is believed that this virtual elimination of heater failures through use of cast-in heaters may be attributable to several factors. Cast-in heaters do not have to be operated at the same high wattage as ring heaters. Indeed, cast-in heaters can be operated at

significantly lower wattage while still achieving the necessary temperature at the die surface. Additionally, cast-in heaters have substantially lower heater surface temperatures during heat up and production than in the case of ring heaters. Also, cast-in heaters are not nearly as susceptible to the ingress of water and so distortion of the cast-in heater at the die contact surface is not likely to occur. The cast-in heater thus maintains a flatter surface to provide more uniform heating as well as better heat transfer.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

5/16/02
Date

Dana Markwell
Dana Markwell